

Chapter 4 Plan Development

TITLE SHEET DEVELOPMENT

Quick Punch List

- Create a Title Sheet Using Make Sheetz
- Edit Headings Using Border Macro
- Create a Location Map
- Create a Layout Drawing (If Necessary)

CREATE A TITLE SHEET

Step One: Open MicroStation

To begin, double click on your **MicroStation** icon and select your project from the project pull down. Open any file.

Step Two: Create Title Sheet

Select **File>Make Sheetz** from the *Main Menu*.

Use a numbered prefix. The default is 001_ which makes this the first sheet in your final plan set.

♪ If for some reason you will need two title sheets for this project, add the suffix “1” to avoid having two files with the same root file name.

✓ *Refer to page 1-12 for help making sheets.*

Step Three: Editing Text Headings

Do not manually edit the text in your title sheet. Use **Workspace>Edit Project Data(PCF)** to change all of the variables in your drawing. Variables are any text in your drawing that has a “\$” or “@” symbol in it. The text that remains can be edited by using the *Edit Text* tool or by selecting **Text>Edit Text** from the *Main Menu*.

✓ *To learn more about editing variables in your PCF file, refer to PCF Editing on page 1-19.*

CREATING LOCATION MAPS

Step One: Open Location Map

From the *Main Menu*, select **File > Open Location Map**. Select the file called “Statemap-local.dgn”. This should be pointing to your C: or D: drive if you have the Location Map files copied locally. You can open the files over the network, however they are large and will open very slowly. Contact CADD Support if you are pointing to the W: drive for the Statemap#.dgn files.

Step Two: Locate the Project Area

Find the area of the state that your project is located. Once you have located this area, run the location map macro from your *Main Menu* by selecting **Macro > Location Map**.

Step Three: Place the Square

Once the macro has been activated a square boundary element will appear on your cursor. (If it doesn't, you may be zoomed in too close.) Place the square around the project area trying to encompass any text that you want to appear in your map.

- 🎵 The size of the square can be modified to cover a larger area by adjusting the X, Y and scale (i.e. X=2, Y=2, Z=2 to double the area of the map) before placing it on the map. Contact CADD Support for assistance if necessary.

Step Four: Save the Locmap.dgn

A dialog will appear stating the directory path and a default file name of **Locmap.dgn**.

- ① *If this is not the right directory, hit Cancel. You will need to start back at Step No. 1 of the “Create a Title Sheet”, selecting the correct PIN from the “Project Pull-down” in the MicroStation Manager dialog.*

If all looks good, Hit **OK** to let the macro create the file. It will then open the file it just created.

Step Five: Copy Map to Clipboard

After the macro opens the file it just created, it will select all elements and copy them to the clipboard. It will show you the **Information** dialog (Figure 4-1).

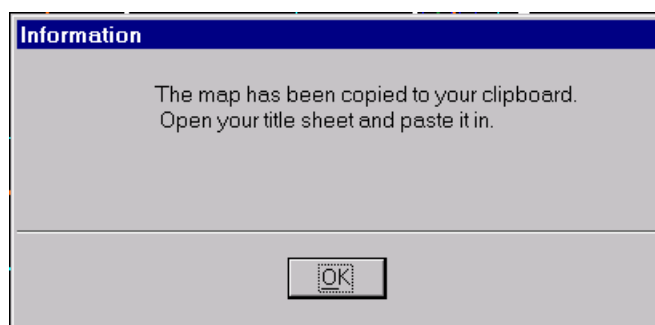


Figure 4-1: Map copied to clipboard

① *This step doesn't always work. What the macro intends to automate is selecting all of the elements in the file, snapping (without accepting) to a corner of your box and activating the Edit>Copy command. Do this manually if the automation doesn't work.*

Step Six: Paste Map

Select **Edit>Paste** from the *Main Menu*.

Set the scale in the *Tool Settings* dialog. Here are some scales to use when pasting the location map into certain files:

1:1 border drawing, (i.e. 001_Title.dgn) set the scale to .00000789 for U. S. Customary projects (.00001 for metric projects).

1:250 border drawings, (i.e. 003_Plan1.dgn) set the scale to .0025. This is used for the Bridge Programs metric "Preliminary Plan" drawings.

1:300 (1" = 25') border drawings, (i.e. 003_Plan1.dgn) set the scale to .00234. This is used for the Bridge Programs U.S. Customary "Preliminary Plan" drawings.

Snap to the corner of the location map box on your title sheet. Left Click to accept.

Once you have pasted the map into the title sheet you can clean it up as necessary.

♪ If you adjusted the size of your map to cover a larger area (i.e. 2 times larger) enter one of the scales above depending on the application. Use *AccuDraw*'s calculating ability to divide ("/") the X, Y and Z by 2 to get the map to fit the standard map border. Adjust the scale as necessary.

CREATING A LAYOUT (HIGHWAY PROJECTS WITH A SURVEY & DESIGN)

Introduction

Once the proposed design file (i.e. highway.dgn or bridge.dgn) has been created and flattened to zero, follow these steps to create a layout drawing to be placed on the title sheet.

Step One: Create a Layout Drawing

Open any drawing in your PIN directory if you're not already in one. From the *Main Menu*, select **File>Make Sheetz**. Create a drawing called **z_layout.dgn**.

✓ Check page 1-12 for more about creating drawings using the *Makesheetz* macro.

Step Two: Place a North Arrow

Do a *Fit View*. The default *View* orientation should be *Top* which means North is up. Using the **Plan Sheet Settings Manager**, select **Symbols & Linestyles > North Arrow True**. In the *Tool Settings* dialog, enter 90 degrees in the *Active Angle* field, click on the padlock to lock the X, Y, and Z fields. (Figure 4-2)

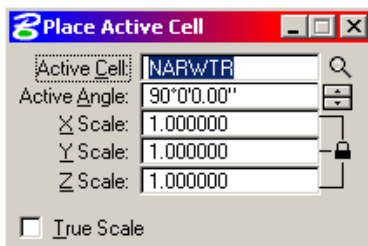


Figure 4-2: Adjust Active Angle, Padlock locked

Type **300** (250 metric) in the *X* field, followed by a (**Shift+8**), then, enter the total number of clip boundaries on the main line for your project (your referenced hdplan.dgn boundaries) in the layout drawing. This will size the cell appropriately for the title sheet. (Figure 4-3)

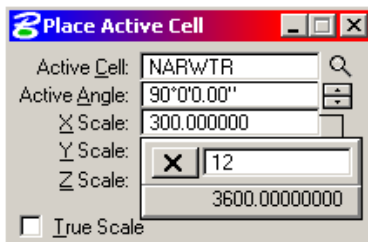


Figure 4-3: Using AccuDraw's Calculator

Set the cell down close to the boundaries in your layout drawing, with a *Datapoint*.

Step Three: Rotate Your View

Rotate your view using the **3 points** method until the graphics in your view are aligned the way you want to see them on your title sheet.

- ♪ To make clip boundary horizontal: snap and accept to the lower left and lower right corners of your boundary. These two points define the X-axis. Snap and accept to the upper left corner of the boundary to provide the final point (positive Y direction according to your first point).

Step Four: Create a Saved View

Using the **Plan sheet Settings Manager**, select **Create Plan Sheets > Create Saved View**. Now define the rectangle for your saved view. Be sure to encompass all clip boundaries and your north arrow. Read the dialog and follow the prompts.

A dialog will appear asking for a name of your saved view. Name it “**layout.**” A description is not necessary.

Leave the *Add Shape* box **unchecked**.

Click **Make**. (Figure 4-4)



Figure 4-4: Saved View Dialog Settings

Step Five: Reference the view into the Title Sheet

Open the **title sheet** (i.e.001_title.dgn).

Go to **File > Reference (Dot)>Attach**.

Select **z_layout** and hit **OK**.

In the *Attach Reference Settings* dialog, select the named view called “**layout**”.

Determine how many *clip boundaries* (plan sheets) on the main line for your project (your referenced hdplan.dgn boundaries) in the layout drawing. Multiply this number by **300** (250 metric). Enter this number in the right most field of the scale (Master:Ref) portion of this dialog to scale your layout file appropriately. (i.e. 12 sheets x 300 = 3600) See Figure 4-5.

- ♪ If after attaching you decide that the area is too large to fit on the title sheet, you can adjust the attachment with a series of commands or simply detach and reattach adding a one to your number of sheets. (i.e. 1 + 12 sheets (13) x 300 = 3900)

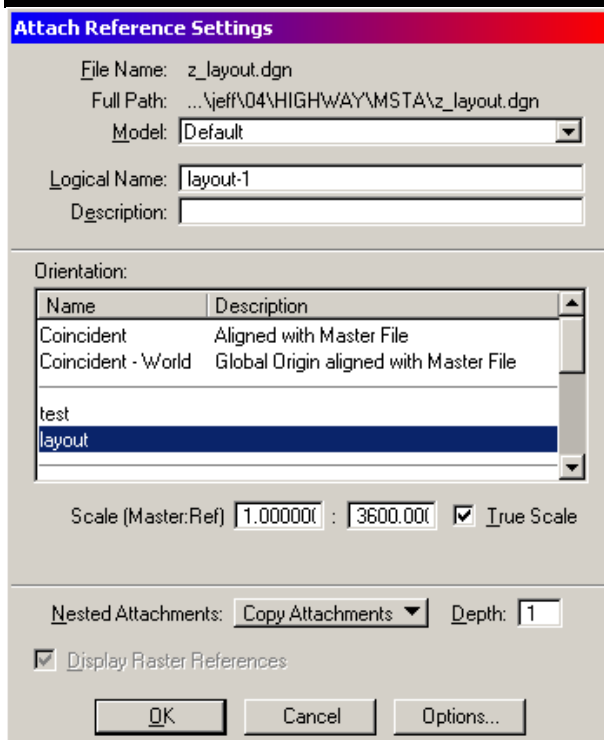


Figure 4-5: Sample Setting for Attaching Layout

Set the *Nested Attachments*: to **Copy Attachments** with a *Depth* set to “1”. This will attach the layout drawing and everything it has attached with it.

✓ Check page 2-67 for an explanation of Reference Nesting.

Click OK and you should see a rectangle on your cursor. Left click to place it down on the title sheet. You can move it if necessary in the next step.

Fit View.

🎵 If you aren't seeing the same thing you saw in your *layout.dgn*, place a fence around the border and select **File>Reference (DOT)>Clip>Boundary>All** and click on your screen.

Step Six: Tweaking the Layout Placement

Once the layout is placed, you can still manipulate the reference files.

Go to **File > Reference (Dot) > Dialog**. Select all reference files in the dialog.

In the **Reference Dialog**, choose **Tools > Move** or **Tools > Scale** or **Tools > Rotate** if things need to be moved, rotated or scaled again. You can repeat this function as many times as you want, being sure that all reference files are selected before manipulating. You may need to move other things around in your Title sheet to make room for it (i.e. scales, location map box, etc).

① When rotating the referenced saved view, rotate it in the “Z” value only.

Step Seven: Stationing the Layout

Introduction

The alignment drawing that is attached is most likely too small to read on your Title sheet. It is also centered in your roadway which is going to be filled in, identifying the new pavement area. The alignment is a temporary attachment to be used as a guide for the next step and can be shut off eventually.

Part One: Open z_layout.dgn

Open your **z_layout** drawing and turn off your graphic group lock (**Settings>Locks>Graphic Groups**).

✓ Refer to page 2-41 for a description of working with graphic groups.

Part Two: Copy Alignment String

Copy your alignment element into the **z_layout** file using the copy tool. It isn't necessary to copy in the station or tick marks.

Part Three: Graduate – Create New Tick Marks

Measure a rough distance from the centerline to a point just outside of the proposed pavement area to determine how long the tick mark will have to be to still be visible once the pavement is filled in.

Use the *Plan Sheet Settings Manager* to place station lines by selecting **Graduate** from the left side, and depending on the proposed pavement widths, select a tick mark that will be long enough to be visible outside of the shaded pavement area. Current options are 20', 25', 40' 50' and 60' for US Customary projects (5 m, 10 m and 15 m for metric projects).

A new toolbox should be on your screen. (Figure 4-6) Click on the **Place cell along** tool.

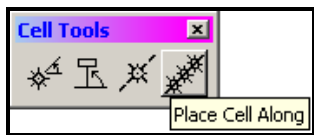


Figure 4-6: Pace Cell Along Tool

When the dialog opens, enter the desired spacing for the tick marks. Defaults are 100' or (10 meters). (Figure 4-7)

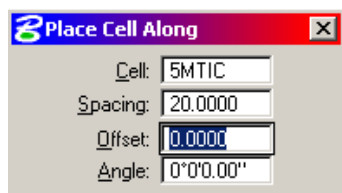


Figure 4-7: Place Cell Along Dialog

Snap to the beginning of your centerline to see how your ticks are going to be placed. Click to accept or reject the placement. If your alignment does not start at an even station, delete a portion of the “copied” center line to force it to start at an even station.

♪ The normal text for stationing is 100 feet (20 meters), but if you have a really long job,

maybe you might want to space them at 1000 feet (100 meters). Be sure that the *Offset* and *Angle* are both set to “0”. (Figure 4-7)

Part Four: Adding Text for Stations

Open your **001_title.dgn**. It’s best to station the alignment in the Title Sheet to produce standard size text.

Right Click on the *Settings Manager*. Set the *Category Scale* to 12” = 1 ft. (1:1 metric) (Figure 4-8).

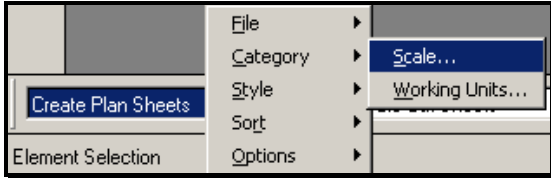


Figure 4-8: Right Click, Category Scale

Using your *Plan Sheet Settings Manager*, select **Proposed Text and Dims>Standard Text (Normal)**. Start placing your station text. For long jobs, it may make sense to place your stations every 1000 feet (100 meters).

- ♪ Use AccuDraw’s functionality of “o” (origin) and “rq” (rotate quick) to place the text at different angles along your project’s centerline.

Step Eight: Shading the Layout Drawing

Introduction

This step will shade all proposed pavement areas. Due to certain limitations, you will have to do this in sections as opposed to one large filled shape. Shading should be done in the **z_layout** drawing. It is important that your proposed design (**Highway.dgn**) has been flattened to “0” along with the **z_layout** drawing.

- ♪ On large projects, shading may not be necessary because the layout is scaled down so small that when printed, the proposed pavement lines themselves are so close together that they appear to be one solid line. Print out a test plot of the Title Sheet to determine if shading is necessary.

Part One: Open z_layout

Part Two: Create Temporary Lines

Use the *Smartline* tool to create lines across (perpendicular) the roadway every 1000 to 2000 feet (100 to 200 meters) or so to break the shading into manageable areas. Straight portions of the alignment may allow you to shade larger sections at a time.

- ♪ The highway.dgn typically needs to have lines draw on it to signify the match points on the beginning and ending of the main line and the limit of work on the side roads. Do this work in the highway.dgn by *Smart Matching* the shoulder or travelway line then drawing a line connecting the opposite shoulders at the beginning and ending of the project.

Part Three: Flatten

Flatten the drawing by selecting **Macros>Flatten** from the *Main Menu*.

Part Four: Select Boundary Lines of Area to be Shaded

Using your *Power Selector* or similar means, select the lines that define the boundaries of area to be shaded (i.e. edge of pavements, and 2 junk lines you created earlier).

Part Five: Create Regions

Select **Group>Groupings>Create Regions** from the *Main Menu* or pick the **Create Regions** tool from the *Groups* tool box. Set the dialog to look like Figure 4-9.

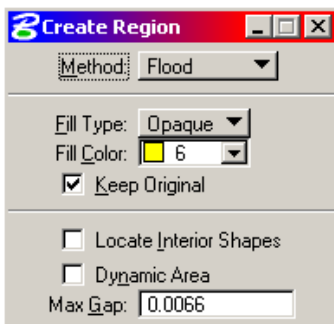


Figure 4-9: Create Region Settings

The color you select is optional. All colors, with the exceptions of 10-16, will print black. Colors 10-16 will print a shade of gray.

The *Level* that you place the shading is optional. It is a good idea to select a *Level* that is not being used.

Part Six: Flood Area

Click anywhere inside of the area you *Power Selected*. Click again to *Accept*. This should fill the area.

- ♪ If you get a warning that says “No Enclosing Region Found”, you can adjust the *Max Gap* to a larger number so the tool will jump gaps in the lines.
- ♪ If you get a warning that says “Shapes are not coplanar”, it could mean that the Highway.dgn or possibly the z_layout.dgn isn’t flattened. Re-flatten both drawings and try again.

If all else fails, change your *Method* to *Points* and use data points to create the filled shape, however, this doesn’t work so well around curves.

Contact your CADD Support for assistance.

Step Nine: Adjusting the Layout Scale

U.S. Customary Projects

To adjust the scale, you will need to take in account what scale you placed the Layout into your title sheet. In Step 5, we counted the number of clip boundaries (12) and multiplied

that by 300 to get 3600. Divide this number by 12 to get the scale per inch of your Layout drawing. In this example your scale per inch would be 300.

You can also find out what scale factor you used by opening the **File>Reference** dialog and double clicking on one of the attachments and looking to the Scale (*Master:Ref*) portion of the dialog. Divide the reference scale by 12.

Use **Text>Edit Text** from the *Main Menu* to edit the text in the bar scale Figure 4-10.

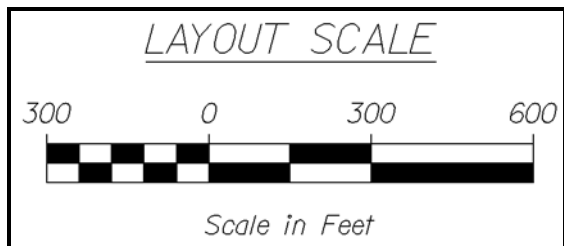


Figure 4-10: U.S. Customary Layout Scale Example

Metric Projects

To adjust the scale, you will need to take in account what scale you placed the Layout into your Title Sheet. In Step 5, we counted the number of clip boundaries (12) and multiplied that by 250 to get 3000. Multiply this number by .02 and the result is the scale used in the Layout bar scale (i.e. $3000 \times .02(\text{constant}) = 60$ meters).

You can also find out what scale factor you used by opening the **File>Reference** dialog and double clicking on one of the attachments and looking to the Scale (*Master:Ref*) portion of the dialog. Multiply the reference scale by .02.

Use **Text>Edit Text** from the *Main Menu* to edit the text in the bar scale Figure 4-11.

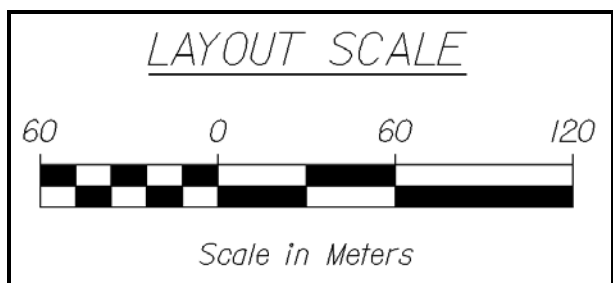


Figure 4-11: Metric Layout Scale Example

Step Ten: Place Text on the Title Sheet

Use the *Settings Manager* (**Prop. Text and Dims>Standard Text (Normal)**) to enter text labels for Side Roads, Town Lines, Sheet Numbers, etc.

CREATING A LAYOUT (NO SURVEY)

Introduction

This section is intended for projects with no survey. We will use a portion of the Location Map to create a rough drawing as your layout.

Step One: Place Temporary North Arrow

Before you clip out an area from the Location Map for your layout, place a small vertical line near the project area. This will represent north. North is up in the map.

Step Two: Place a Fence

Use the *Place Fence* command and set the *Fence Type* to **Shape** and the *Fence Mode* to **Clip** (Figure 4-12) (**Group>Fence>Shape**).

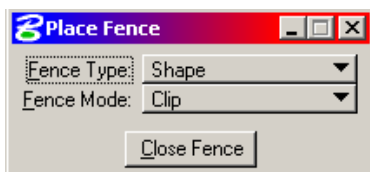


Figure 4-12: Place Fence – Clip Mode

Place your fence around the project area, as close to your project as possible, encompassing only the beginning of side roads and your temporary north arrow Figure 4-13.

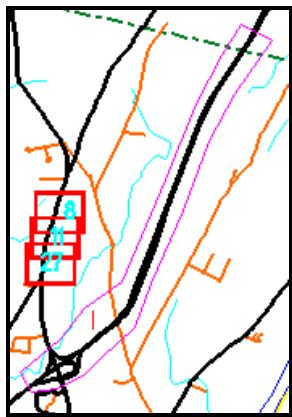


Figure 4-13: Fence Encompassing Project Area with Temporary North Arrow

Step Three: Copy Fence

From the *Main Menu*, select **Group>Copy Fence** or use the *Manipulate Fence Contents* tool. Verify that the *Fence Mode* is set to **Clip** (Figure 4-14).



Figure 4-14: Manipulate Fence Contents Settings

Place a *datapoint* to define where you want to copy from and click another *datapoint* in the middle of your title sheet to place the contents of the fence.

Step Four: Scale and Rotate

Use *Power Selector* and select your new layout elements. Use a combination of *Scale Element (Zip>Scale)* and *Rotate Element (Zip>Rotate>Rotate By 3 Points)* to adjust the layout to fit within your Title Sheet.

Step Five: Adjust Scale

The scale of the layout drawing pulled from the location map will be somewhat rough. It may be a good idea to simply remove the scale for the layout and add a note stating it is “Not to Scale”.

Step Six: Place North Arrow

Using the **Plan Sheet Settings Manager**, select **Symbols & Linestyles > North Arrow True**. In the *Tool Settings* dialog, set the active angle to “0” and set the X, Y, Z scales to 1. Snap to the middle of the line you placed in the location map to represent the temporary north arrow. Before *Accepting*, type “O” for origin, then follow it by “RQ” on your keyboard. Snap to the end of the line that should point to north, Accept the *Accudraw* rotation. Now move the arrow to wherever it fits well on your title sheet. Use a *datapoint* to place the arrow. Delete the “temporary line representing your North Arrow.

Step Seven: Place Text on the Title Sheet

Use the *Settings Manager (Prop. Text and Dims>Standard Text (Normal))* to enter text labels for Side Roads, Town Lines, Sheet Numbers, etc.

TYPICAL SECTION SHEET DEVELOPMENT

Quick Punch List

- Create a Typical Sheet Using Make Sheetz
- Run “Typsectn” or “Template” Macro
- Edit and add cells
- Add Dimensions and text
- Edit Border Using Border Macro

Things to Remember

Whether you use one of the typical section programs to draw your lines or not, there is a certain strategy to keep in mind when you are drawing such things.

First of all, you should draw all your lines first, as the program would have you do.

Then you should trim up all the lines, adding cells if necessary.

Then you should add the dimension, text and notes.

❗ *Use the Cross-Sections Setting Manager to draw new lines.*

🎵 Draw the typical completely before you move on to labeling and dimensions. This will help you keep the elements in the right levels without needing to *Match Element Attributes* all the time.

Freehand Template Techniques

✓ *Refer to page 2-51 for an example of using Accudraw to draw roadway sections.*

CREATING A TYPICAL SECTION DRAWING FILE

Step One: Open MicroStation

Open MicroStation and use the project pull-down list to move to your project directory.

Open any drawing file in your PIN directory.

Step Two: Create a New Drawing(s)

Select **File > Make Sheetz** to create a new file for every typical sheet you will need. If there will be more than one, be sure to add a suffix in the make sheets dialog (Figure 4-15).

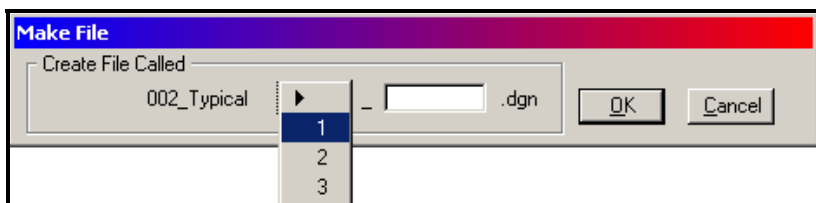


Figure 4-15: Selecting a Suffix for Multiple Drawings of the Same Type

✓ Refer to page 1-12 for help creating files.

CREATING TYPICALS USING THE “TYPSECTN” MACRO

Introduction

The program will draw your “finished grade”. It allows you to draw a “normal” or “superelevated” section with side slopes. It doesn’t produce a finished product however, it is a good start.

- ♪ Users who want to draw a box section need to trim up the slope lines and manipulate it accordingly.

Step One: Start Typical Section Program

From the *Main Menu*, select *Macros>Create Typical*.

Step Two: Enter lane Information

You will be prompted for the **Lane Info**, which includes the widths of travel ways, shoulders and the ratio of the side slope (Figure 4-16).

- ♪ Based on the units of your project, the macro will fill in your dialog with common defaults. Changes that you make to the dialog are remembered for when you create your next typical. Level, color, style and weights are set for you based on workgroup preferences.

Left Travel Way		Right Travel Way	
Width	12.0	Width	12.0
Decimal Slope	-0.02	Decimal Slope	-0.02

Left Shoulder		Right Shoulder	
Width	6.0	Width	6.00
Decimal Slope	-0.040	Decimal Slope	-0.04

Left Slopes				Right Slopes			
Fore Slope Rise	1.00	Fore Slope Rise	1.000				
Fore Slope Run	4.00	Fore Slope Run	4.000				
Back Slope Rise	1.00	Back Slope Rise	1.000				
Back Slope Run	2.00	Back Slope Run	2.000				

All Dimensions Should be in Meters

Figure 4-16: Typical U.S. Customary Lane Info

Enter Left and Right **Travel Way** and **Shoulder Widths** in feet (or meters).

Enter **Decimal Slope** using a “ – ” for negative slopes.

- ♪ A “ + ” is **not** needed for positive slopes.

Adjust these slopes for super elevated sections.

Enter the side slope “rise” - which is the second number in your slope ratio for U.S. Customary projects (the first number in your slope ratio for metric projects).

Enter the side slope “run” - which is the first number in your slope ratio for U.S. Customary projects (the second number in your slope ratio for metric projects).

Click “OK” when finished entering in all the fields.

❶ *You should keep a value in all the boxes, as opposed to using “0”. This will allow MicroStation to draw the typical and you can go back and edit what you want.*

An “Alert” window gives you the opportunity to cancel before moving on to enter your pavement depths. Hit **OK** and then *Datapoint* to enter a centerline position within the MDOT border.

♪ You can move the typicals around later using *Power Selector* so don’t worry about this position too much.

Step Three: Enter Pavement and Subgrade Depths

For reconstruction or full construction jobs, it is best for you to continue with the program and let it draw your pavement layers for you (Figure 4-17).

♪ For some overlay jobs, this may be a good time to stop. You can finish drawing the pavement depths and existing conditions “by hand”.

Figure 4-17: Typical U.S. Customary Pavement Design

Enter **Total Pavement Depth** in your travel way using decimal feet for U.S. Customary (decimal meters for metric projects).

Enter **Total Base Depth** in your travel way using decimal feet for U.S. Customary (decimal meters for metric projects). (This is your depth of subgrade at centerline.)

Enter **Total Pavement Depth** in the shoulder areas using decimal feet for U.S. Customary (decimal meters for metric projects).

Click **OK**.

You should be left with a representation of your proposed pavement and subgrade (Figure 4-18).



Figure 4-18: Finished Typical

- ♪ If you only have subgrade in your shoulder areas, enter the depth in the **Total Base Depth** field and edit the typical when done.

CREATING TYPICALS USING THE TEMPLATE MACRO

This macro was created for the Bridge Program to make drawing templates on Cross Sections easier. This can be used for Typical Sections as well. It allows you to place guardrail and curbing, and remembers your setting should you need to make more than one.

Template Information			
Left Travel Way		Right Travel Way	
Width	12.000	Slope %	-0.020
Left Shoulder		Right Shoulder	
Width	6.0000	Slope %	-0.040
Left Slopes		Right Slopes	
Fore Slope Rise	1.0	Fore Slope Rise	1.0
Fore Slope Run	4.0	Fore Slope Run	4.0
Back Slope Rise	1.0	Back Slope Rise	1.0
Back Slope Run	2.0	Back Slope Run	2.0
Enter 0.0 if No Guard Rail is Desired			
Guard Rail Placement			
Guard Rail Left	0.0000	Guard Rail Right	0.0000
Thrie Beam Left	0.0000	Thrie Beam Right	0.0000
Enter 0.0 if No Curb is Desired			
Curb Placement			
Type 1 Left	0.0000	Type 1 Right	0.0000
Type 3 Mold 1 Left	0.0000	Type 3 Mold 1 Right	0.0000
Type 3 Mold 2 Left	0.0000	Type 3 Mold 2 Right	0.0000
Type 5 Left	0.0000	Type 5 Right	0.0000
All Dimensions Should be in Master !			
OK		Cancel	

Figure 4-19: Typical U.S. Customary Template Information Dialog

The panels are very similar to the “typsectn” macro with the exception of cell placement Figure 4-19.

The Guardrail and Curb placement requires that you give the offset from the centerline to the cell. Look to the Standard Details for the proper offsets or ask your designer.

DIMENSIONS, TEXT, AND NOTES

① *Always use the Settings Manager when placing dimensions and text. This is especially helpful in keeping your elements on the correct levels.*

✓ *Check page 2-20 for a complete introduction to the Settings Manager.*

Why are levels so important? These files may need to be archived, translated to different CAD systems, or they may be used in the creation of As-Builts. If elements are on the right level, these processes will be much easier.

ESTIMATE SHEET DEVELOPMENT

Quick Punch List

- Add Items To Estimator (If Necessary)
- Export Items from “Estimator”
- Make Estimate Sheet Using Make Sheetz
- Import Items from CSV file
- Adjust Lump Sum Items (If Necessary)

EXPORTING QUANTITY ITEMS FROM THE ESTIMATOR

Introduction

This is a description of how to export a list of Quantities for the purpose of filling out the Estimated Quantities sheet. This assumes that all or most of the items have been previously entered into the Estimator program.

✓ *For information on using the Estimator program, refer to page 15-19.*

Step One: Getting into Estimator

First you will need to double click on the icon on your desktop.

❶ *Contact CADD Support if you do not have an icon. Experienced users: Map any drive letter to \dotaug1\%CommonProgman\ folder. Create a shortcut on your desktop to the Highest.exe program file.*

Now log in (Figure 4-20)

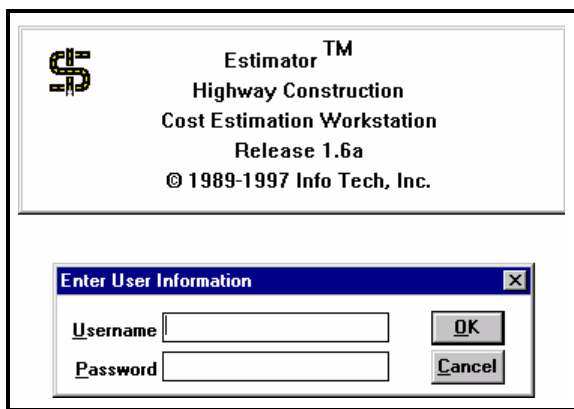


Figure 4-20: Log In to Estimator

“Beta” is the user name and “User” is the password.

♪ Usernames and passwords are case-sensitive: you must capitalize the first letter of each word.

Step Two: Exporting (*.he) File

Once you are in the Estimator program you must select the appropriate file that was created by either you or the Designer and open that file.

Now that you have selected the file, go to **File > Export**.

Here is the important part, you must select the **Export File Format:** and change this to: **Lotus (Category Items)** even though we do not use Lotus products (Figure 4-21).

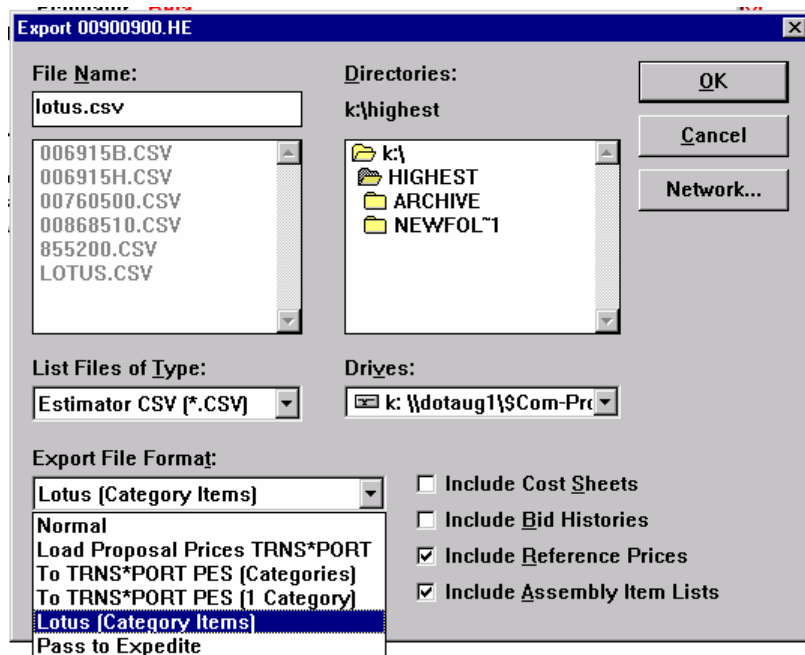


Figure 4-21: Export Dialog

Next you will need to change the directory to the appropriate PIN directory that you are working in. To do this you need to select the drive letter that the PIN is sitting in. In this case MDOT standards is the **Y** drive.

Once there, double click on the Pin folder, your PIN number and to your workgroups \MSTA folder. This is where the macro looks for this file (i.e. **y:\pin\9009\00\highway\msta**).

Now that everything is set, hit the **O.K.** button and the **Estimator** will go through its process of exporting the document into the **MSTA** folder in your pin directory.

IMPORTING LOTUS.CSV FILE INTO ESTIMATED QUANTITIES SHEET

Step One: Open MicroStation

To begin, double click on your **MicroStation** icon and select your project from the project pull down. Open your ###_Estimate.dgn if it exists, otherwise, open any file.

♪ Some older projects have an estimate.dgn in the MSTA directory. This file doesn't have any grid lines in it and should be deleted. Make a new sheet.

Step Two: Make an Estimate Sheet

If you don't have an estimate sheet (i.e. ###_Estimate.dgn), go to **File > Make Sheetz** and create one.

✓ Check out page 1-12 for more information about making sheets.

Step Three: Run Estimate Macro

Once you are in the drawing, you need to activate the macro to begin importing your estimate items. To do this, go to **Macros > Estimate**. You will be prompted to "snap to the upper left corner of first table" (Figure 4-22). *Accept* with a left click.

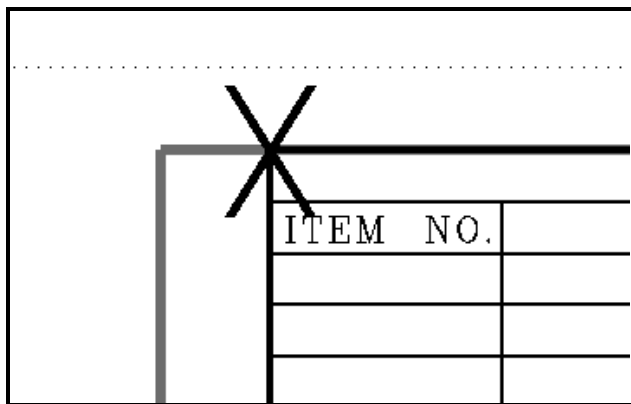


Figure 4-22: Example of Snap Point "Upper Left Corner of First Table"

Step Four: Adjust Quantities

This should have filled out your Estimated Quantity sheet. It will be necessary to edit text on a couple of the items that are supposed to be **L.S.**, but because the Estimator requires actual quantities for the item, it will require that you change the value to "1". Use the *Edit Text* tool.

The Contract Section would rather not see decimals in the quantities. Edit the text and round all decimal number up to the nearest whole number.

❶ *If you would rather use a different justification on certain text, use **Text>Rejustify (Macro)** and select the text you want to change. When the dialog comes up, pick the new justification.*

- ♪ If there are changes to the Estimator (*.he) file, you will need to export another Lotus.csv file and overwrite the existing one. Then go into the file, delete the existing list, and re-run the macro.

Additional Sheet Needed?

Occasionally you may have more items than one Estimate Sheet will hold. In this case, the macro writes the additional information off to the right of the border. If your original border hasn't been dropped, copy it and place it with the additional items. (If it has been dropped, get a copy from the USBorder/Border cell library.)

Place a fence around the new border and select **Utilities>Development Tools>Fence File** from the *Main Menu*. When the new dialog appears, supply the name of an additional Estimate Sheet (i.e. 004_Estimate2.dgn) being sure to increment the prefix and suffix. Click OK. Click on the screen to *Accept* the command. Open the new sheet. If all looks good, delete the extra border and contents from the original file. Contact CADD Support for assistance.

DRAINAGE SHEET DEVELOPMENT

Quick Punch List

- Copy Drainage Spreadsheet into PIN directory
- Enter drainage data into **drainage.xls**.
- Save **drainage.xls** as a *tab-delimited text file*.
- Create a Drainage Sheet using Make Sheetz
- Run the Drainage Macro

USING THE DRAINAGE SPREADSHEET

Introduction

This macro merges data from an excel spreadsheet into MicroStation. There are a couple of steps involved. Follow them exactly. Do not attempt to be creative in the naming of your file or create multiple files to somehow trick the program. It won't work.

Step One: Copy the Spreadsheet

The **drainage.xls** spreadsheet is a standard form. The **drainage.xls** template is located in the **W:\MDOT MicroStation Utilities\Spreadsheets & Notes** folder. Make a copy of this file and place it in your workgroup's **MSTA** folder before entering your project data.

❗ *Do not edit the spreadsheet on the W: drive!*

Step Two: Enter Drainage Data

Enter your drainage data into the spreadsheet. Do not attempt to reformat the spreadsheet in any way. Add all the information to this one spreadsheet even if there isn't any grid lines present in the rows or columns. Save your file.

🎵 Make sure you save your changes by choosing **File > Save**.

Step Three: Save as TXT file

Our macro cannot access excel data when it is saved in workbook (xls) format. From **Excel**, choose **File > Save As...** This will open the **Save As** dialog (Figure 4-23).

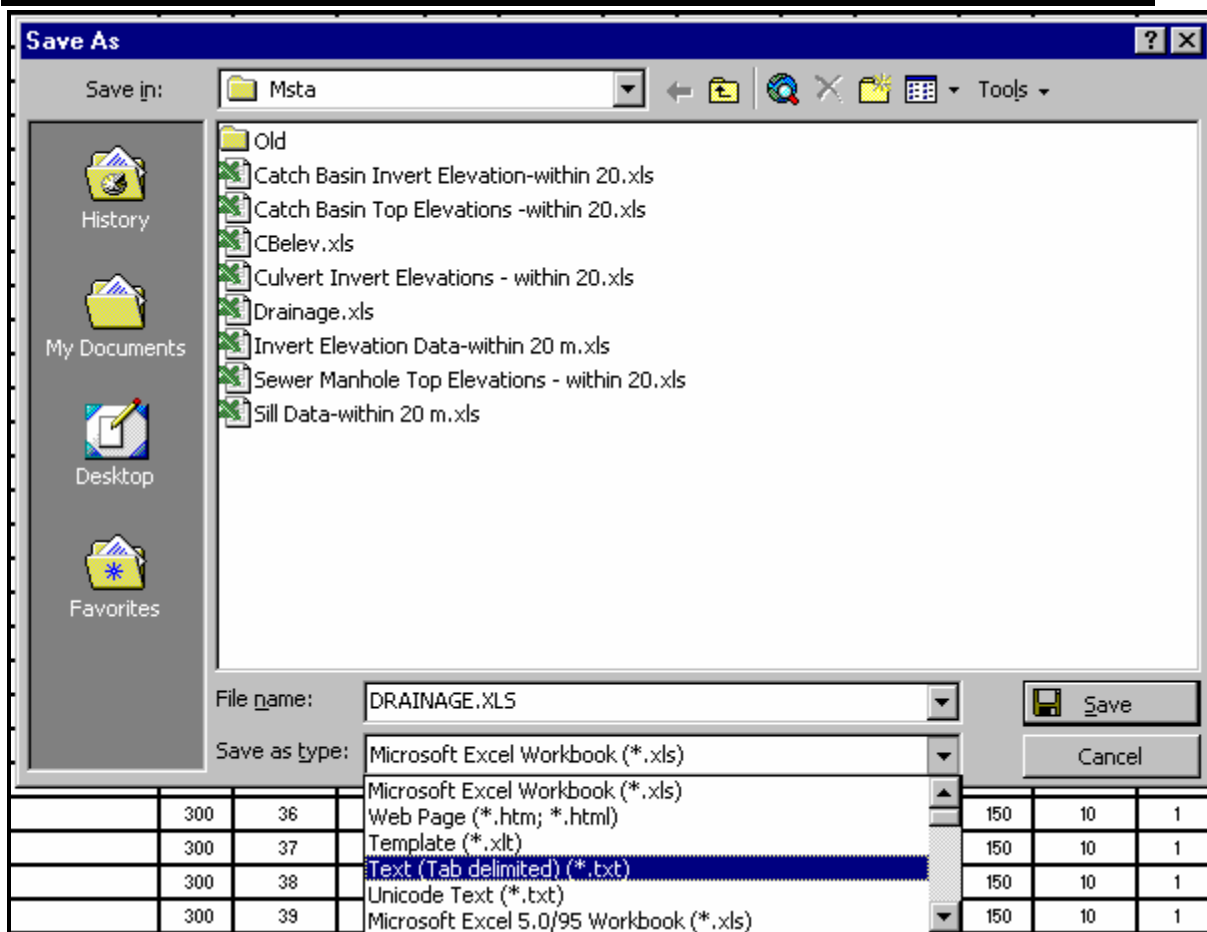


Figure 4-23: Save As Txt

From the bottom of this dialog, choose **Text (Tab delimited) (*.txt)** in the **Save as type** field.

Check that the file name is **DRAINAGE.TXT** and push the **Save** button. This will bring up a **Microsoft Excel** dialog warning you about the limitations of tab delimited text (Figure 4-24).

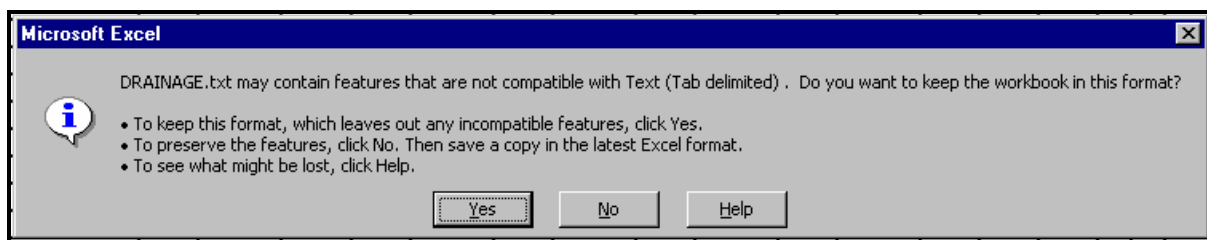


Figure 4-24: Save As Warning

Tab delimited text files aren't capable of handling all the formatting options of Microsoft Excel. This is not going to be a problem for us.

Dismiss this dialog by pushing the **Yes** button.

♪ Notice that you are now editing a file called “Drainage.txt”. This filename is a must for the macro to work (Figure 4-25).

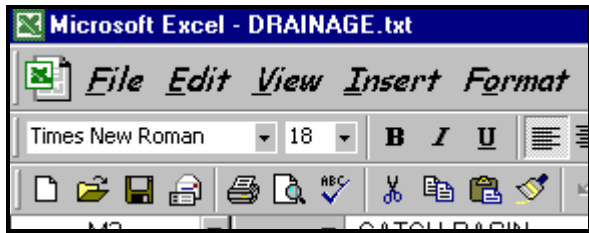


Figure 4-25: New File Name

You are now finished with **Excel**. Choose **File > Exit**. You will get a warning dialog like Figure 4-26.

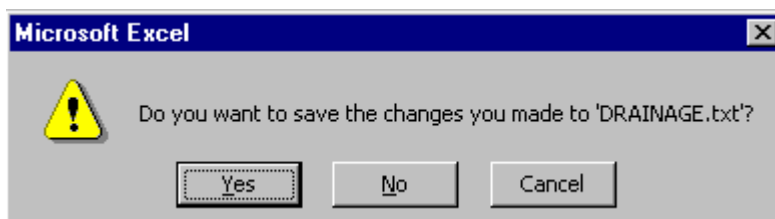


Figure 4-26: Save Changes?

You do **not** need to save this file again. Dismiss this dialog by pressing the **No** button.

IMPORTING DRAINAGE INFORMATION

Step One: Open MicroStation

To begin, double click on your **MicroStation** icon and select your project from the project pull down. Open your ###_Drainage.dgn if it exists, otherwise, open any file.

- ♪ Some older projects have a drainage.dgn in the MSTA directory. This file doesn't have any grid lines in it and should be deleted. Make a new sheet.

Step Two: Make an Drainage Sheet

If you don't have a drainage sheet (i.e. ###_Drainage.dgn), go to **File > Make Sheetz** and create a *numbered* sheet, with *Highway* workgroup. Choose *Drainage* as the file type.

- ✓ Check out page 1-12 for more information about making sheets.

Step Three: Run the Macro

From the *Main Menu* select **Macros>Drainage**.

MicroStation will prompt you "Drainage > Snap to upper left corner of first table" *Snap* to the point marked with an "X" in Figure 4-27, and *Accept*.

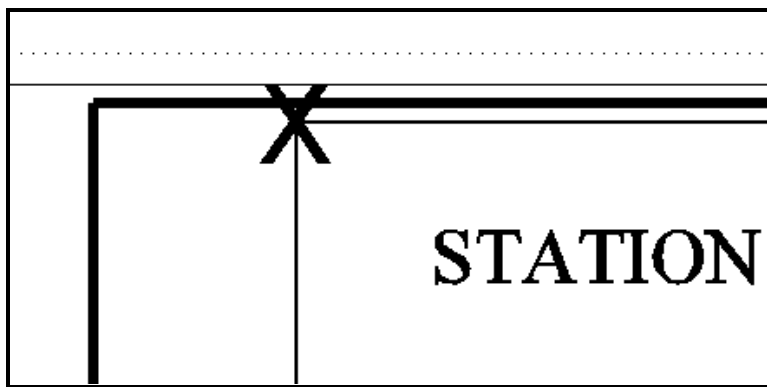


Figure 4-27: Upper Left Corner

MicroStation will place a column of text in every column of the table has information.

- ① *If you would rather used a different justification on certain text, use **Text>Rejustify (Macro)** and select the text you want to change. When the dialog comes up, pick the new justification.*

Multiple Drainage Sheets

If you have more than 78 lines of drainage information, the macro will start placing another column of text to the right of the first table and place an additional border.

Place a fence around the new border and select **Utilities>Development Tools>Fence File** from the *Main Menu*. When the new dialog appears, supply the name of an additional Drainage Sheet (i.e. 004_Drainage2.dgn) being sure to increment the prefix and suffix. Click OK. Click on the screen to *Accept* the command. Open the new sheet. If all

looks good, delete the extra border and contents from the original file. Contact CADD Support for assistance.

NOTES SHEET DEVELOPMENT

Quick Punch List

- Copy Template from W: drive to your PIN on the Y: drive
- Open and Edit the Template in Microsoft Office (i.e. Word or Excel)
- Save as new Format (according to specific instructions)
- Open new file, select range of text and Copy to Clipboard
- Open MicroStation, Make Sheetz and set text Style
- Paste (according to specific instructions)
- Edit Sheet Type in title box
- Run **Macros>Border Information**

LOCATION AND EXPLANATION OF TEMPLATE FILES

Introduction

We are using Microsoft Word for all text arranged in paragraph form, to be pasted into MicroStation. Text that is intended to be in columns should be produced in Microsoft Excel. We have placed template files in the following directory - **W:\MDOT MicroStation Utilities\Spreadsheets & Notes**. Please copy files from this location into your projects PIN directory under your workgroups MSTA folder. Do not edit the files on the W: drive as these are the master files.

General Notes

There are a few template files available to be used for generating your General Construction Notes. They require editing for every project and should be checked for accuracy.

Imperial General Notes.doc - This file has a listing of the most common General Notes used on U.S. Customary projects.

Metric General Notes.doc - This file has a listing of the most common General Notes used on metric projects.

Metric Expanded General Notes.doc - This file includes all of the General Notes in the *Metric General Notes.doc* file, plus, an additional 50+ notes that may pertain to more complex projects. Check both of these files and decide which one suits your projects needs.

Summary of Excavation and Borrow

The Summary of Excavation and Borrow is an Excel spreadsheet. It can be easily pasted into a MicroStation drawing for your final plans. The file is called **Summary-Excavation-Borrow.xls**. This form is sometimes confusing to do by hand on complicated projects. Just enter the figures and the formulas will take it from there. It also allows you to delete the lines (rows) that aren't needed. When doing this, the user must also delete out any lines with an "ERR" in them, starting from top of the sheet to the bottom.

Use the same instructions used when pasting Construction Notes into MicroStation.

Estimating US Customary Projects

We have a spreadsheet to help do one of the most tedious tasks of Estimating which is calculating your **Cuts** and **Fills**. Once you supply the stations, without the (+) symbol, the sheet will automatically fill in the distances between stations. (Do not enter numbers in the shaded cells) After you enter areas or lengths, it will automatically average them and give you totals. Each sheet will give you totals that are summarized on the **Index** of the spreadsheet. Right now there are only five pages for the calculations and an index. If more pages are needed, ask your support staff to create them and revise the master. Here is a listing of files available for English projects.

ENGLISH-ESTIMATE-CUYDS.xls - This is for estimating items requiring a cubic yard measurement (i.e. Common Excavation, Gravel, etc.).

ENGLISH-ESTIMATE-SQYDS.xls - This is for estimating items requiring a square yard measurement (i.e. Loam, Sod, etc.).

ENGLISH-INDEX.xls - This is for indexing your estimate book that you turn in with your project. Many people are not including this with their comps, but if you are, this will make it easier. Also you can experiment with exporting a text file from Highest (Estimator) with out the prices.

Estimating Metric Projects

We have a spreadsheet to help do one of the most tedious tasks of Estimating which is calculating your **Cuts** and **Fills**. Once you supply the stations, without the (+) symbol, the sheet will automatically fill in the distances between stations. (Do not enter numbers in the shaded cells) After you enter areas or lengths, it will automatically average them and give you totals. Each sheet will give you totals that are summarized on the **Index** of the spreadsheet. Right now there are only five pages for the calculations and an index. If more pages are needed, ask your support staff to create them and revise the master. Here is a listing of files available for Metric projects.

METRIC-ESTIMATE-CUMETERS.xls - This is for estimating items requiring a cubic meter measurement (Common Excavation, Gravel, etc.).

METRIC-ESTIMATE-SQMETERS.xls - This is for estimating items requiring a square meter measurement (Loam, Sod, etc.).

METRIC-INDEX.xls - This is for indexing your estimate book that you turn in with your project. Many people are not including this with their comps, but if you are, this will make it easier. Also you can experiment with exporting a text file from Highest (Estimator) with out the prices.

GENERAL NOTES SHEETS

Step One: Copy the Template File

Using Windows Explorer, browse to the W:\MDOT MicroStation Utilities\Spreadsheets & Notes folder. Select the General Notes file that best pertains to your project. Copy the file from this location into your projects PIN directory, under your workgroups MSTA folder.

Step Two: Open and Edit Using WORD

Open and edit the Microsoft Word file, supplying your project specific information. Save the file in its native format (.doc).

Step Three: Save As .txt File

From the Main Menu, go to **File > Save As.**, Select “**Plain Text (*.txt)**” in the *Save as Type* pull down (Figure 4-28). Verify that the path of the new file name is pointing to your PIN directory.

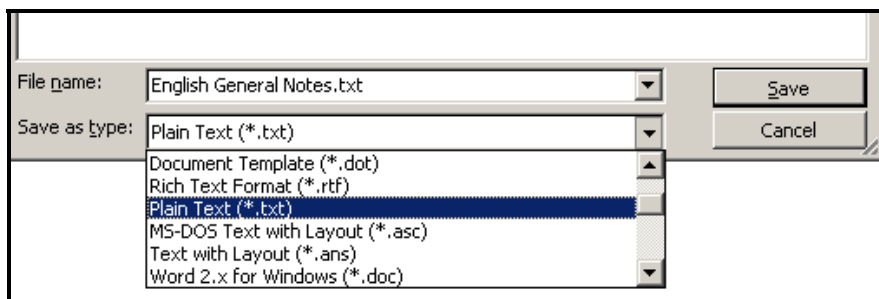


Figure 4-28: Save as type- Plain Text (*.txt)

A new dialog will open. Place a check mark in the “Insert Line Breaks” box (Figure 4-29) and leave the other defaults as is. Click OK.

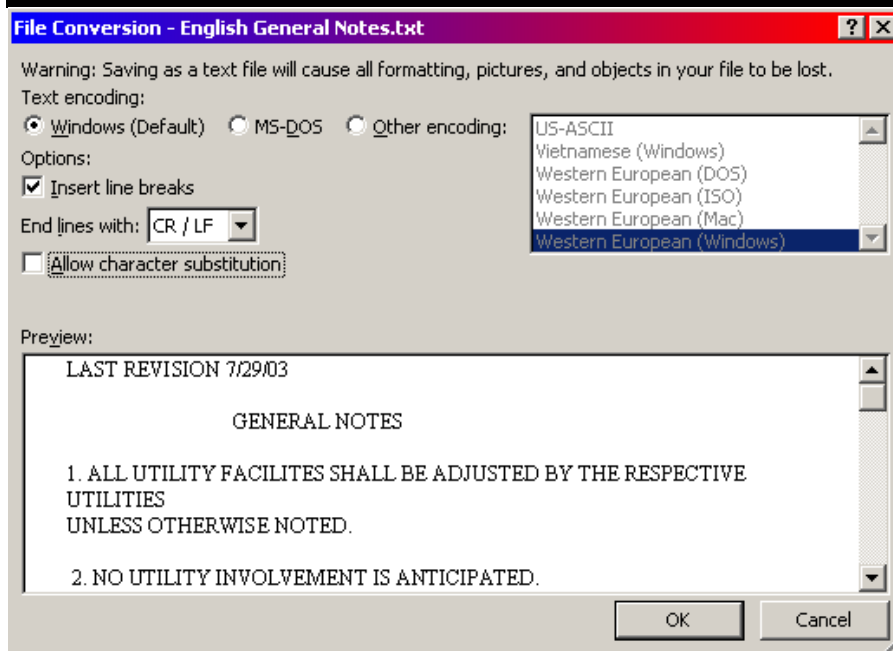


Figure 4-29: Select Insert Line Breaks

Close the Word document.

Step Four: Open and Copy the Text from the New File

Using Windows Explorer, browse to your projects PIN directory and open the file that you just saved with the **.txt** extension. Select the range of text you wish to paste into MicroStation. From the Main Menu, select **Edit>Copy**.

- ♪ You can select all of your text and manipulate it prior to placing it in the MicroStation *Text Editor* dialog. The *Text Editor* has the same capabilities as the Notepad text editor. You can Copy, Paste and Cut by either Right clicking in the dialog or using shortcut keys **Ctrl+C (Copy)**, **Ctrl+V (Paste)** or **Ctrl+X (Cut)**.
- ♪ If you are familiar with PFE Editor, Right Click the file and select “Open With...” then select “Choose Program” and select PFE Editor. You can select up to 100 lines of text and still fit it within your border. Notepad doesn’t give you this information.

Step Five: Open MicroStation

Open MicroStation by double clicking the MicroStation icon on your Desktop and pick your PIN number from the project pull down. Open the MicroStation file that you wish to place the General Notes in. If necessary, create a new file from the Main Menu using **File > Makesheetz**. Use a numbered drawing, selecting **Notes** from the drawing type dialog. Consider adding “General” in the suffix to better specify the sheet type.

✓ See the *Make Sheetz* documentation on page 1-12.

Step Six: Set Your Text Size and Font

Right click on the Settings Manager and select **Category > Scale**. Normally, General Notes are placed on a border that hasn’t been scaled. Select 12in. = 1 ft. for U.S. Customary

projects (1:1 for metric projects). From the Settings Manager, select **Proposed Text and Dims > Standard Text (Normal)**. This sets your text attributes.

Step Seven: Paste the Selected Text

While your **Text Editor** has focus (active), type **Ctrl+V** to paste the notes into the window or *Right Click* to bring up the “Right-Click Menu” and select **Paste** (Figure 4-30).

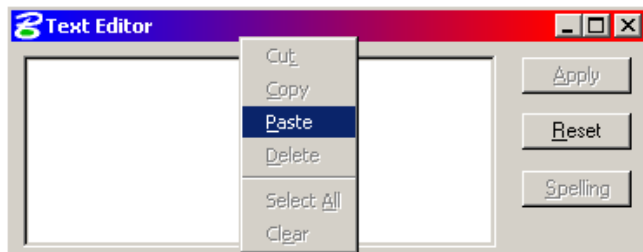


Figure 4-30: Right Click with mouse - Paste Option

Step Eight: Placing Text in the File

Place the text as you would any other text (*Datapoint*) utilizing *AccuDraw* and/or tentative snaps to place it accurately.

If the text you pasted will not fit inside of your border, use the *Edit Text* tool and click on the text. In the *Text Editor* dialog, select the extra text that isn't fitting within the border starting from the bottom up and type **Ctrl+X**. This will “cut” the extra text to the Clipboard. Click *Apply* to accept the changes. Click on the *Place Text* tool. With your cursor in the *Text Editor* dialog, type **Ctrl+V** to paste the remaining text. Place it down using *AccuDraw* to place it accurately. Continue until all of the text fits within the border. Create a second sheet if necessary.

❗ *If you have over 200 lines of text, the text block may not display when you do a fit view. This is normal due to the limitations of multi-line text (text nodes). Zoom in to see the text.*

Step Nine: Editing Text

Edit text like you would any other text by selecting the **Edit Text** tool from the Main tool frame.

CONSTRUCTION NOTE SHEETS

Introduction

Depending on who generated the construction notes, you may be working with an Excel Spreadsheet, reports generated from MX software or hand written hard copies.

These instructions are not intended to explain how to use Excel, but instead, it explains how to take a construction note file and paste it in to MicroStation.

If you are using reports generated from MX, these files are in a **.prn** format. These files can be opened directly using Notepad or the PFE editor. You can select the text and copy it directly into a *Text Editor* dialog for placement. These come in well, but may need adjustments to columns. You can also importing the reports into Excel to provide better formatting abilities.

Importing Reports into Excel (Informational/Optional)

If you are building the spreadsheet from **.prn** reports, select **Data>Import External Data>Import Data** from Excel's main menu. Browse to your workgroups MSTa folder and select the **.prn** file. Click OK. A text import dialog will open. Select **Delimited**. (Figure 4-31) Click Next.

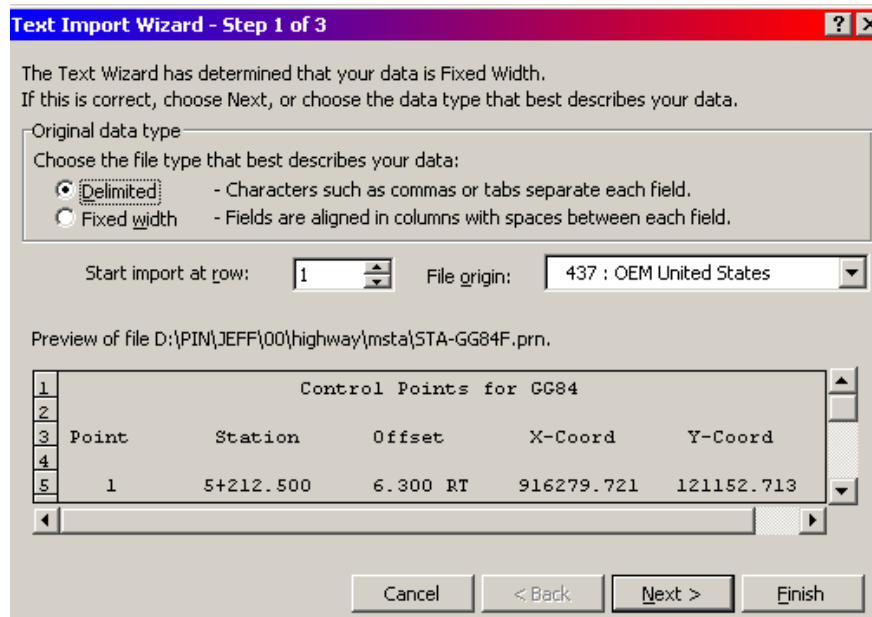


Figure 4-31: Text Import Wizard

In the next dialog, make an additional selection for "Space" as your delimiter (Figure 4-32). The other selections by default do not need changing. Click **Next**.

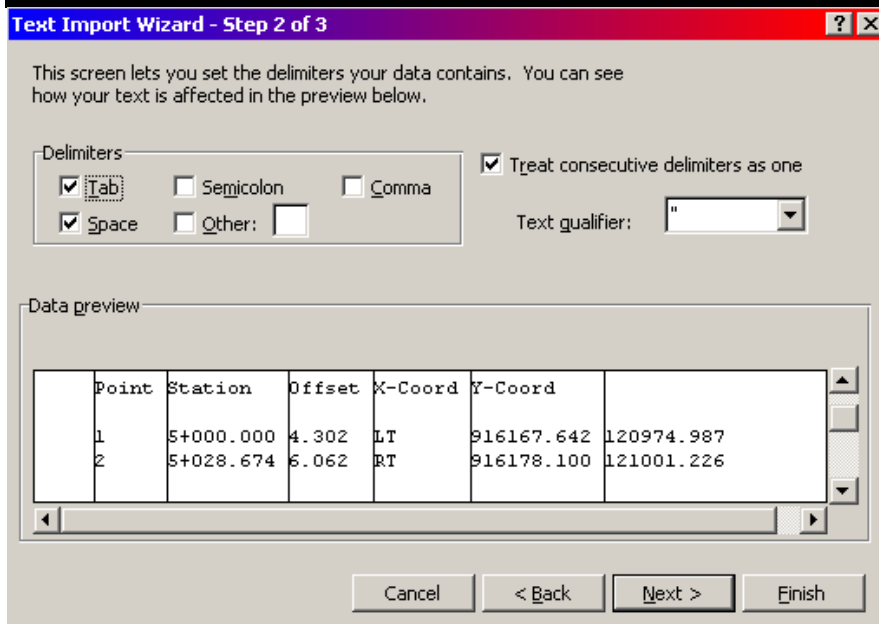


Figure 4-32: Select "space" as your delimiter

In the final dialog of importing text you have the opportunity to format cells in the spreadsheet. "General" is normally good for this setting. If you wish to omit a column, click on the column header and click on the "Do not import column (skip)" button. Click **Finish** (Figure 4-33).

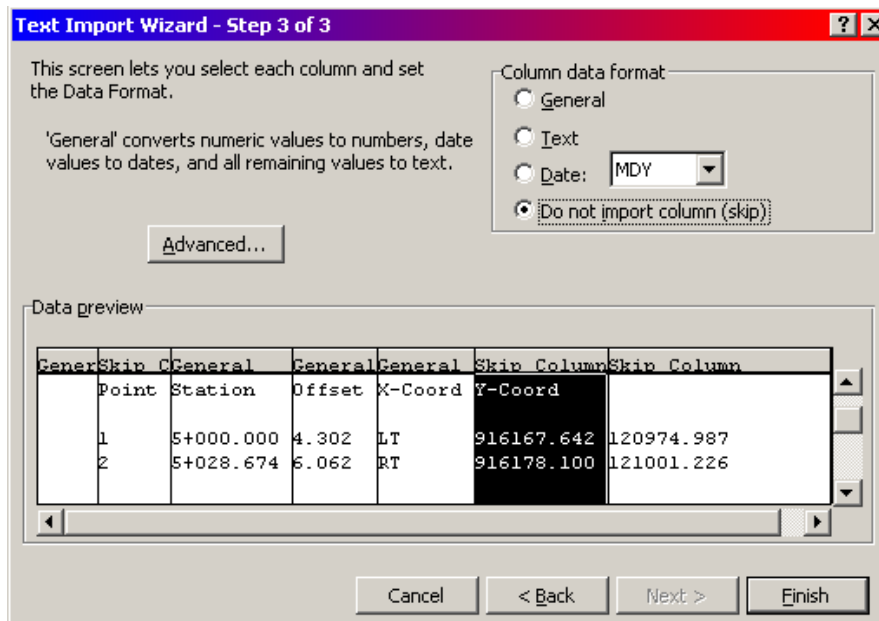


Figure 4-33: Import Wizard column formatting

Step One: Open Spreadsheet

Locate and open the spreadsheet (.xls file) in your PIN directory that has the Construction Notes in them.

- ♪ Right click in your MSTA folder and select **New>Microsoft Excel Worksheet** if you need to create one. Name it appropriately and add in your information.

Step Two: Save as Text (tab delimited)

If you have to make any changes to the spreadsheet, make the changes and save them.

Select **File>Save As...** from Excel's main menu. Change the *File As Type* pull down to **Text (Tab Delimited)(*.txt)**(Figure 4-34). Notice that your file name now has a new extension. Click **Save**.

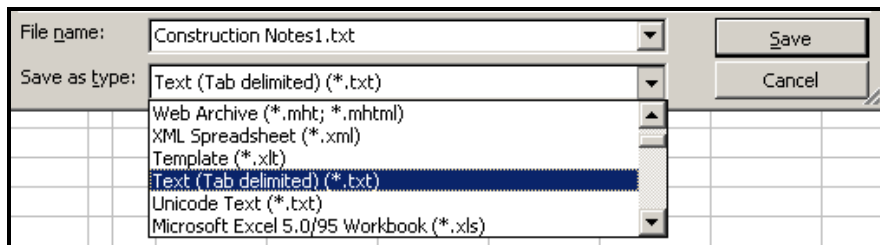


Figure 4-34: Save as Type Text (Tab delimited)(*.txt)

- ♪ If you have multiple sheets in one Excel Spreadsheet, you will need to go into each sheet and save them individually as a different file name (i.e. Construction-Note1.txt, Construction-Note2.txt). The .txt format cannot handle multiple pages all at once.

Step Three: Warnings

You will get a series of warnings. First one saying the format doesn't support multiple sheets. Click **OK**. (Figure 4-35)

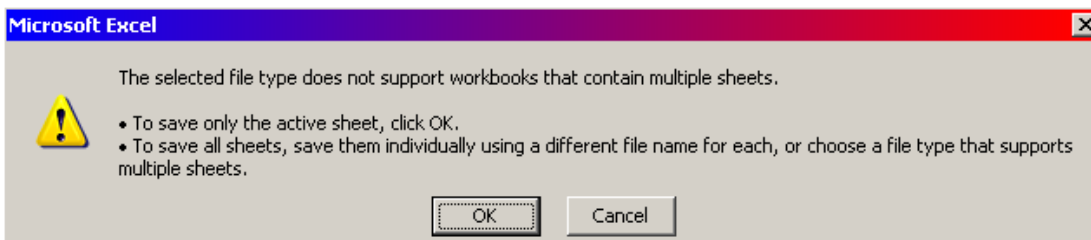


Figure 4-35: Warning One – Click OK

At the next warning click **Yes**. (Figure 4-36)

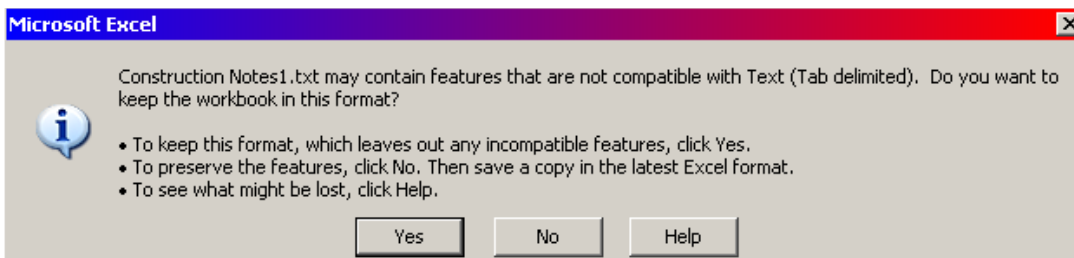


Figure 4-36: Warning Two – Click Yes

Close the Excel session. When asked to save the document, click **NO** (Figure 4-37). You have already created the .txt documents as a separate file and do not need to save the changes in the Excel workbook.

- ① *If had made changes after saving it as a .txt file, do a Save As... and change the "Save as type" back to .xls*

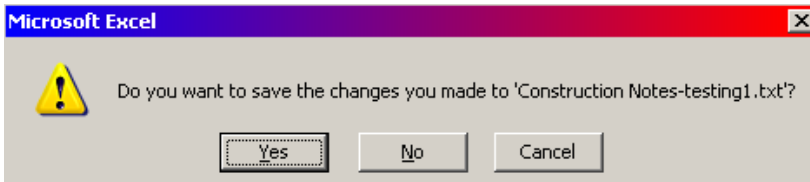


Figure 4-37: Warning when closing the file – Click NO!

Step Four: Open MicroStation

Open MicroStation by double clicking the MicroStation icon on your Desktop and pick your PIN number from the project pull down. Open the MicroStation file that you wish to place the Construction Notes in. If necessary, create a new file from the Main Menu using **File > Makesheetz**. Use a numbered drawing, selecting **Notes** from the drawing type dialog. Consider adding “Construction” in the suffix to better specify the sheet type.

Step Five: Set Your Text Size and Font

Right click on the Settings Manager and select **Category > Scale**. Normally, Construction Notes are placed on a border that hasn’t been scaled. Select 12in. = 1 ft. for U.S. Customary projects (1:1 for metric projects). From the Settings Manager, select **Proposed Text and Dims > Monospaced Text**. This sets your text attributes.

Step Six: File Import>Text

Go to **File>Import>Text** from the Main Menu. Select the file that you created with the .txt extension. Place the text with a data point, utilizing AccuDraw to place it accurately amongst other notes on your sheet.

Step Eight: Editing the Text

After placement, you will notice that there may be some adjustment necessary. Use the Edit Text tool in your *Main Tool Frame* or use the *Main Menu* and select **Text>Edit Text**. Click the text and adjust as necessary.

- ① *The original .xls file is a handy document because it can be used to generate item lists in your Estimate Book that we turn in to Contracts. It’s up to the team as to whether or not you keep the master .xls file up to date or edit the changes within MicroStation only.*

GEOMETRIC SHEET DEVELOPMENT

CLEAN-UP THE GEOMETRY

Introduction

Once the geometry file has been created in MX and is placed in your PIN directory, there is some cleanup required. In the future, we hope this process will be automated by using a macro and/or mapping tables. This section describes how to adjust the line styles of the original drawing to the appropriate style desired in MicroStation.

Step One: Opening and Editing the Geometry

To begin, double click on your **MicroStation** icon and select your project from the project pull down. Open your design file (geometry.dgn) and *Fit View*.

- ❗ *If design changes are made to curb placement, entrance widths, or other elements in the geometry.dgn, it may be necessary to adjust the in the Highway.dgn file to reflect the same changes to your normal plan sheets. Consider only using certain parts of the geometry file that are unique from the actual proposed design. You could attach the proposed design file (i.e. Highway) to the geometry.dgn and shut off levels that your don't need so that any changes made are reflected on both plan sheets and geometric sheets.*

Part One: MX Enquire

- *Turn the Graphic Group lock off (Settings>Locks>Graphic Groups).*

Under the **Macro** menu, choose **MX String Info**. An **Enquire** button should pop up (Figure 4-38).



Figure 4-38: Moss Enquire

Press the **Enquire** button.

Click an element to find out what it is called. The attributes of the element you picked will be displayed in a new dialog window.

The **Element Name** is what you are interested in most. If you don't know what the element name is referring to, select **Macros>MX String Search** and type in the name. If the name is recognized, it will display the description.

Go to **Macros > Select By MX Attributes**. Under the **Model** pull down, select the model listed.

- 🎵 There may be multiple models in your drawing, but normally, there is only one called **geometry**. If there are multiple models, you will have to do this same routine for each and every one.

In the **Name** field, type in the name of the object you wish to have selected. If this element

name has numbers in it, supply the characters then use the wildcard “**” after these characters. This will select all MX elements in your drawing that have the same name. Do not enter a value in the **Object** pull down.

Hit **Select** to pick the elements.

Part 2: Setting the Attributes

The quickest way to set the attributes of an element is to utilize our *Plan Sheet Settings Manager*. Right click on the Settings Manager and pick **Category>Scale**. Select desired scale of your geometric plans normally 1 in. = 25 ft. (1:250 for metric). If what you **Enquired** on represents proposed curb, choose **Proposed Curb, Ret. Wall, GR** from the left side, then choose the type of curb on your project to set the attributes.

Part 3: Changing the Attributes

Click on the **Change Element Attribute** tool in the *Main Toolbar*. Place a check in the **Use Active Attributes** and all of the attributes boxes except for **Class** and **Use Fence** (Figure 4-39). By using the *Settings Manager* in **Part 2**, Level, Color, Style and Weight should be set for you. Click on the screen to change the attributes.

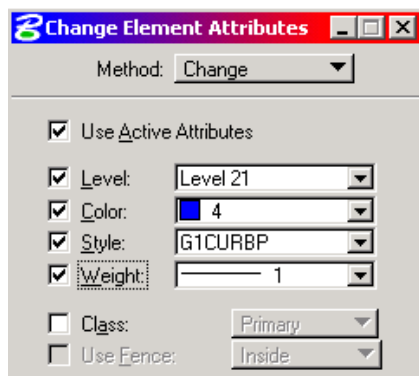


Figure 4-39: Use Active Attributes

Repeat the steps above on all elements that require a custom line style in MicroStation (i.e. retaining walls, curbing, and sometimes, proposed underdrain).

Part 4: Finishing Up

Once all custom line styles are changed to the proper style, all that remains in the active drawing are lines and circles for the geometry.

These lines should be selected and changed to a weight 3. Using the **Edit > Select By Attributes**, check the box to select attributes by weight of “0”. Hit **Execute**. Only these should highlight. Now, use the *Change Element Attributes* tool and select only the weight and set the number value to 3. Click on the screen to make the change. Close the *Select By Attributes* and click **Cancel** to stop filtering elements. If you have elements in your file with heavier weights, select them using the *Select By Attributes* and change them to weight 3 also.

Step 2: Placing Notes from MX Reports

The MX designer can export station and offset reports from MX of the curb locations, curve data, control points and Catch Basin locations. These reports usually have a .prn extension. They can be read with Notepad or PFE editor or imported into Excel. You have a couple of options for importing them into MicroStation, but it's up to user discretion on which option is best.

♪ It is a good idea to place them into the individual geometric plan sheets as opposed to the geometry drawing.

Option 1 - Leave these as .prn files and copy and paste them directly into your **Text Editor** after selecting **Proposed Text and Dims>Monospaced Text**.

Option 2 - Open/Import them into Excel as to better enable a user to use this information for generating estimate computations for items that will be used in the Engineer's Estimate book, then save them as a tab delimited *.txt file and import them through MicroStation's **Main Menu (File>Import>Import Text)**.

✓ Refer to page 4-39 for the documentation on creating Construction Notes.

We have a couple of grid boxes available that can be used to group your data. From the *Plan Sheet Settings Manager*, select **Geometric Plans>Control Point Box** and/or **Curve Data Box**.

♪ Open each individual geometric plan sheet (i.e. 021_geometry.dgn) and paste your notes directly into the border drawing.

Step 3: Annotating Point Numbers

Use the *Plan Sheet Settings Manager* and select **Proposed Text and Dims>Standard Text Normal** to place text for the point numbers. If the circle for the points weren't added to the geometry.dgn, you can place them manually from the *Settings Manager* by selecting **Geometric Plans>Control Points**. Drop the cell and edit the text using the *Edit Text tool*.

CREATING GEOMETRIC PLANS

Geometric plans are required if you have granite curb (Type 1 Curb) or concrete curb (Type 2 curb) on your project.

Step One: Open the geometry.dgn

To begin, double click on your **MicroStation** icon and select your project from the project pull down. Locate the **geometry.dgn** that is in your groups MSTA directory. This file is produced from MX so if it doesn't exist, asks your designer to create one and place the file into your PIN directory.

Flatten this file because it is still 3D. Select **Macros>Flatten** from the *Main Menu*.

Step Two: Reference hdplan.dgn and Alignments.dgn

To reference the files needed for your geometric plan sheets, select **File > Reference (DOT) > Attach**.

Select **hdplan.dgn**. Click **OK**.

This brings up the **Attach Reference File** dialog. Add a **Logical Name** of **hdplan.dgn** for the file.

Attach your file by **Coincident - World (Global Origin Aligned with Master File)**.

Select **True Scale**. Set the *Nested Attachments* to **No Nesting**. Click **OK**.

Repeat this process for the **alignments.dgn**.

✓ *Check page 2-67 for an explanation of Reference File Nesting.*

Click **Fit View** (Figure 4-40) to see your reference files.



Figure 4-40: The Fit View Button

Step Three: Merging the Clip Boundaries into the Geometry File

In order for the next procedure to work, we need to merge the clip boundaries into the active file. This will produce the geometric plans that look identical in orientation to your normal plans sheets. This procedure is assuming that you want a geometric plan for every plan sheet. If you only need a geometric plan for specific areas on your project, place clip boundaries manually in your active file as you would when creating the normal plan drawings.

✓ *Refer to the procedure on page 5-3 to place clip boundaries manually.*

In the Reference File dialog, highlight the reference file (**hdplan.dgn**) then select **Tools>Merge Into Master** from the Menu Bar. Now you will be prompted to select a view. Click a *datapoint* in your view. An informational dialog will open telling you that you are

about to merge one reference file into the current design file. This is what you want to do. Select **OK** to start the procedure. Refresh your window to update the view.

Step Four: Make Geometric Plan Files

From the *Plan Sheet Settings Manager* select **Create Plan Sheets > Create Cut Sheets**. This macro is doing a number of things. First off, it is creating saved views in geometry.dgn that are aligned with the clip boundaries you just merged in or just placed. It asks you what number you want to use for the starting number of the geometric plan sheets. If you know where the sheets will fall in your plan set, enter this number here. The default will be eleven. (Figure 4-41) If you don't know yet where they will fall, use the default and we will utilize the **Sheet Renumbering** routine to organize the files outside of MicroStation.

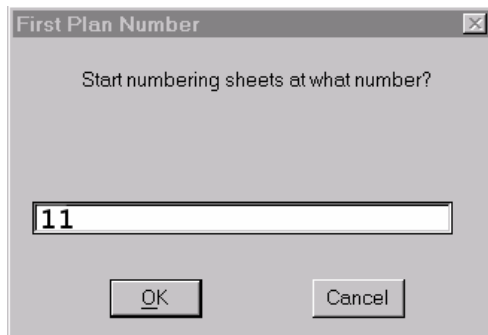


Figure 4-41: Start Numbering At?

The macro will prompt you to enter in the sheet type and will do the rest for you. Enter “Geometry” in the dialog (Figure 4-42) and say **OK**.

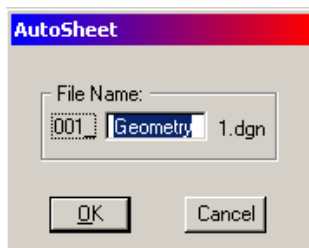


Figure 4-42: Enter File Name

The macro will create and open the first file. Notice the drawing name at the top left of your MicroStation window (Figure 4-43). Choose the saved view name that matches the prefix of your filename.

① As you go through each drawing, verify the prefix of your filename then be sure to pick the saved view that matches.



Figure 4-43: Note File Name

The program is going to attach geometry.dgn to this new file. The *Attach Reference File* dialog is going to pop up and demand some input. It is not necessary to enter a logical name or description.

- ❶ *The macro sets the Nested Attachment to “Live Nesting” regardless of what is selected. Ignore the nesting in this case. Live Nesting allows you to manipulate the display (reference display, level display, additional attachments, etc.) of your cut sheets from within the file the sheets were cut from (i.e. geometry.dgn).*

The name of the saved view should be a number (i.e. 021). Select the saved view from the **Orientation** portion of the **Attach Reference File** (Figure 4-44) dialog that matches your filename and push **OK**.

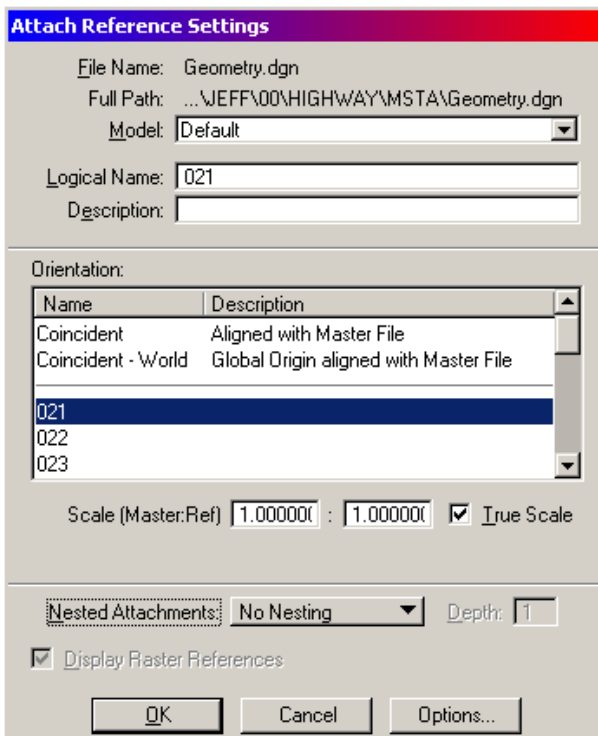


Figure 4-44: Pick a Saved View

This process will repeat for every boundary element you placed.

When you have finished attaching the last of the saved views you’ve made, it will drop you back into geometry.dgn. Open up the files you’ve just created, do a *Fit View*, and see how they look!

Troubleshooting

If you open a geometry plan sheet drawing and the graphics within the sheet are not correct, it could mean a couple of things. Try re-cutting the sheets. It won’t be necessary to place new clip boundaries, simply select **Create Plan Sheets > Create Cut Sheets** and run through the process of attaching the saved views again. This will correct the problems most of the time.

It could also mean that a drawing that is referenced is not at the same *Global Origin* as the other drawings. See CADD Support for assistance if needed or read the documentation on Flattening drawing and shifting the global origins.

Adjusting Saved Views

You can adjust the area of a reference file on your plan sheet by using the reference file dialog **Tools** in combination with *Move*, *Scale* or *Rotate* commands. Be sure to highlight all of your reference files prior to adjusting.

To expand the area of your original saved view, place a fence around your sheet frame and highlight all of the reference files. Choose **Tools > Clip Boundary**.

Place a fence and use the **Tools > Clip Mask** to remove parts of the reference files that may be in your Title Box area.

Re-sheeting

It is possible to use the macro to recreate these sheeted drawings. The macro will prompt you to overwrite duplicate files.

However, it is not capable of only sheeting up one or two sheets—it's all or nothing. If you need to make a change to geometry.dgn (move a clip boundary, add a clip boundary, etc.) you're going to have to go through the entire process of sheeting again.

Just a reminder, it can only sheet up files in the order that the clip boundaries were placed in the file. If you need to add sheets at the beginning of the project, it might be easiest to delete all your clip boundary cells that you placed and start again from scratch (using *Settings Manager Create Plan Sheets > Place Clip Boundary*).